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| APPLICATION NO.                   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------------------------|-------------|----------------------|---------------------|------------------|
| 09/986,324                        | 11/08/2001  | Chidane Ouchi        | 684.3278            | 5125             |
| 5514                              | 7590        | 03/31/2004           | EXAMINER            |                  |
| FITZPATRICK CELLA HARPER & SCINTO |             |                      | KIM, PETER B        |                  |
| 30 ROCKEFELLER PLAZA              |             |                      | ART UNIT            |                  |
| NEW YORK, NY 10112                |             |                      | PAPER NUMBER        |                  |

2851

DATE MAILED: 03/31/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/986,324

Applicant(s)

OUCHI, CHIDANE

Examiner

Peter B. Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 32004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submissions filed on Feb. 17 and Mar. 15, 2004 have been entered.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4, 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable Hikima (4,952,945) in view of Tanaka et al. (Tanaka) (JP 11-298083).

Hikima discloses a projection exposure apparatus with a continuous emission excimer laser (100), an illumination optical system (302), and a projection optical system (304) made of single glass material (col. 1, lines 33-35). Hikima also discloses illuminating reticle with slit-like light and scanning means for scanningly moving the reticle and the substrate to expose the substrate (col. 4, lines 60-61). Hikima also discloses a wavelength detecting means (200) for detecting the wavelength of the laser light from the excimer laser light and a resonator length changing means (21) where a shifting means shifts mirror in resonator (col. 4, lines 24-26), a band narrowing element actuated on the basis of the wavelength detecting means (col. 3, lines 9-

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15). However, Hikima does not disclose a laser for injecting light of a predetermined wavelength into the resonator of the excimer laser. Tanaka discloses a laser (10) for injecting light of a predetermined wavelength into a resonator of the continuous emission excimer laser (303). Tanaka discloses an injection laser having a design wavelength equal to a design wavelength of the continuous emission excimer laser (para 0013-0023). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to provide the optically pumped laser of Eden to the invention of Hikima in order to obtain continuous emission with high energy efficiencies as taught by Eden in col. 2, lines 5-15.

Claims 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hikima (4,952,945) in view of Tanaka et al. as applied to claim 1 above, and further in view of Tezuka et al. (Tezuka) (5,170,207).

The further difference between the claimed invention and the modified Hikima is that Hikima does not disclose half bandwidth of wavelength spectrum indicated in the claims or the projection optical system made from the material indicated in the claims. Tezuka teaches that ArF laser are a well known (col. 7, line 67 – col. 8, line 2), and using ArF inherently include lasers wherein a half bandwidth of a wavelength spectrum of the laser light is not greater than .1 pm and would allow an image of a linewidth of .13 microns. Tezuka also teaches F2 lasers are well known in the art (col. 7, line 67 – col. 8, line 2), KrF laser inherently include laser wherein a half bandwidth of a wavelength spectrum of the laser light is not greater than .08 pm and would allow an image of a linewidth of .09 microns. Tezuka shows in Fig. 3, a projection optical system that includes a lens system made up of plurality of lens designed to optimize exposure

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during lithographic process made with short wavelength lasers (abstract). Further it is discloses that the lenses of the system of Tezuka should be made with SiO<sub>2</sub> or CaF<sub>2</sub> (col. 1, lines 40-44). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to include the projection optical system of Tezuka in the modified apparatus of Hikima in place of the projection lens and to provide ArF and KrF lasers, in order to optimize the exposures performed with short wavelength lasers and to use different lasers recognized in the art as alternatives.

### *Response to Arguments*

In response to applicant's arguments and amendment, Eden reference is withdrawn and Tanaka reference used in combination with Hikima reference.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Kim whose telephone number is (571) 272-2120. The examiner can normally be reached on Monday-Thursday from 8:30 AM to 6:00 PM. The examiner can also be reached on alternate Fridays during the same hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams can be reached on 571-272-2112. The fax phone numbers for the organization where this application or proceeding is assigned is 703 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571 -272-2800.

  
Peter B. Kim

Patent Examiner  
March 26, 2004